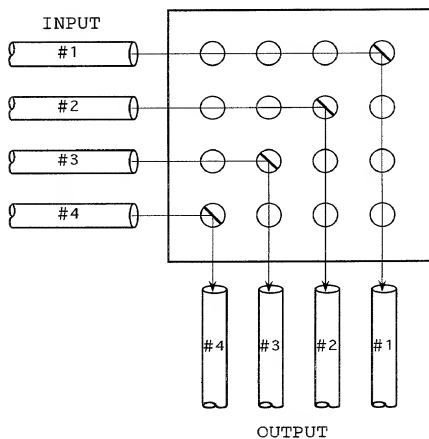


FIG. 1

PRIOR ART



⊘ ; SWITCH CELL (ON STATE; MIRROR INSERTED)

○ ; SWITCH CELL (OFF STATE; MIRROR NOT INSERTED)

FIG.2
PRIOR ART

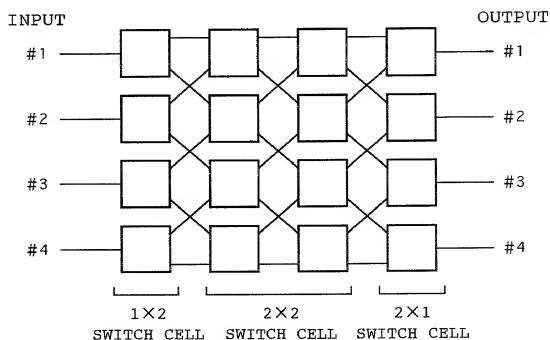


FIG. 3

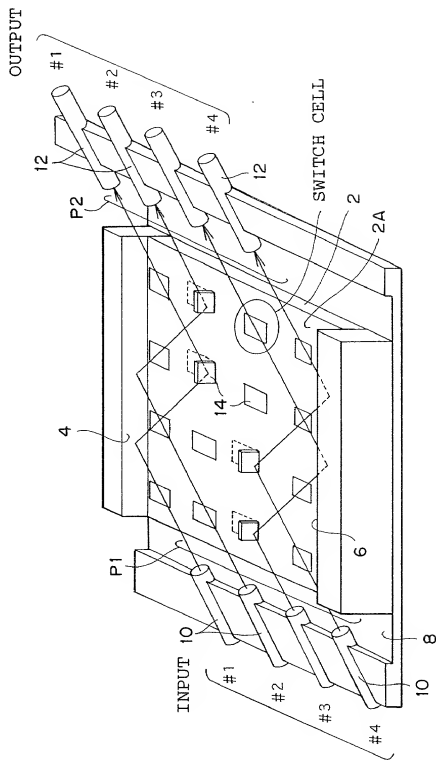


FIG.4A

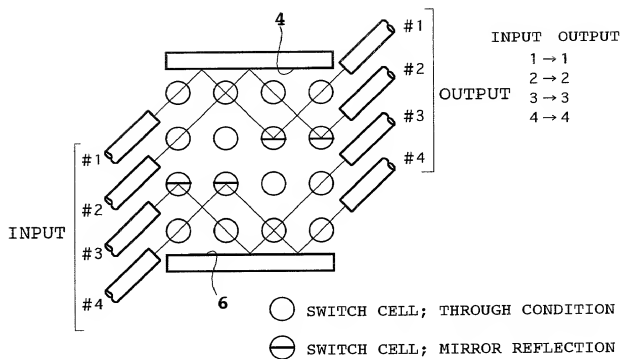


FIG.4B

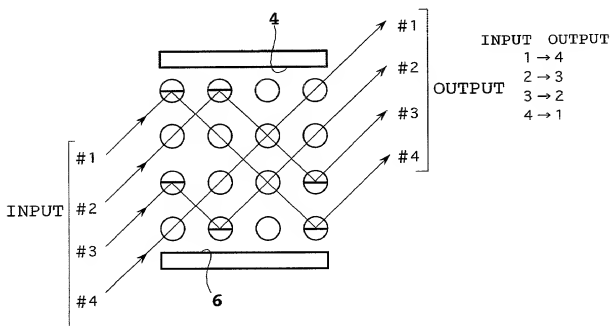


FIG.5

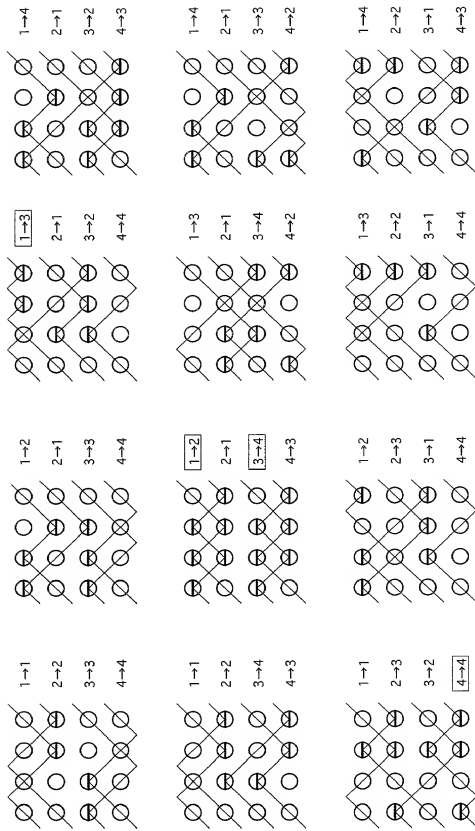
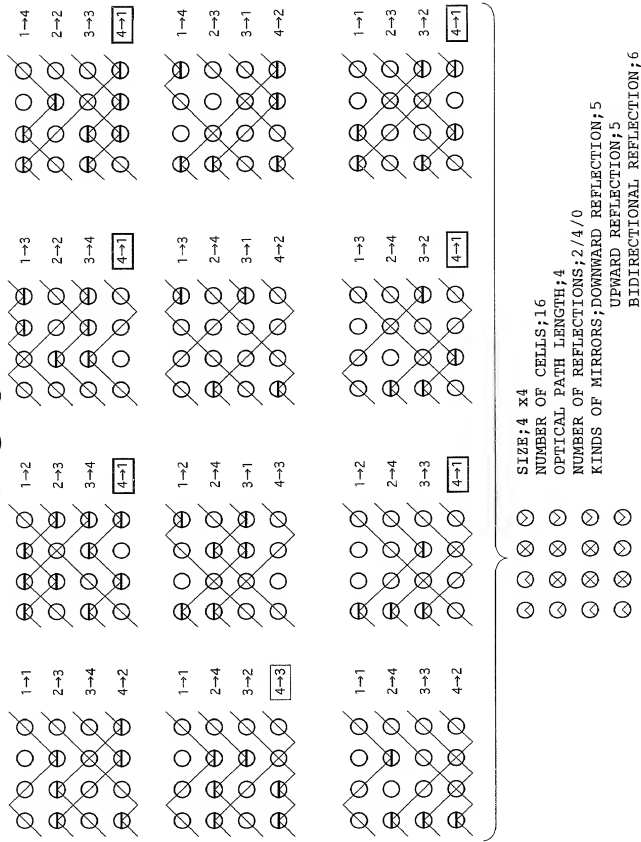
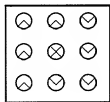


FIG. 6



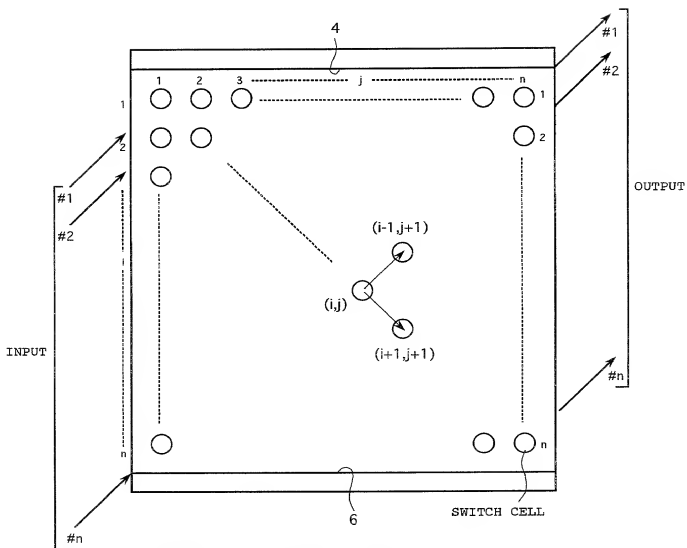
09024605 060901



3 x 3 OPTICAL SWITCH

2 x 2 OPTICAL SWITCH

FIG.8



NUMBER OF SWITCH CELLS;

UPWARD REFLECTION; $n+1$

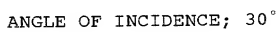
DOWNWARD REFLECTION; $n+1$

BIDIRECTIONAL REFLECTION; n^2-2n-2

TOTAL NUMBER; n^2

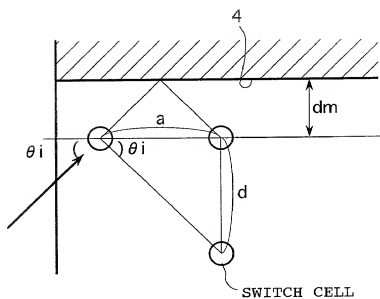
09924506.080901

09024506 000901



ANGLE OF INCIDENCE; 30°

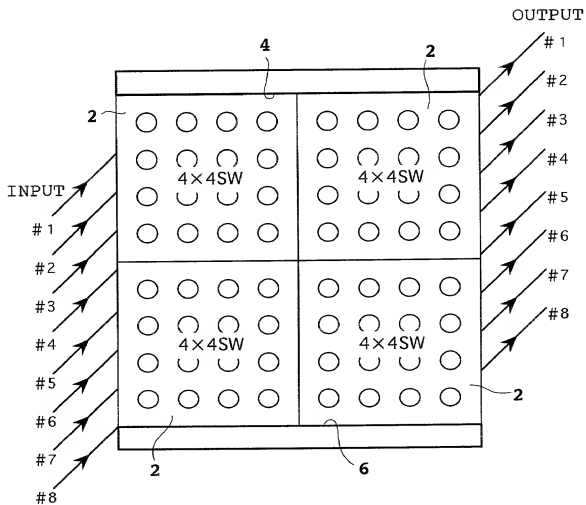
FIG.10



$$d = a \cdot \tan \theta_i$$

$$dm = 1/2 \cdot a \cdot \tan \theta_i$$

FIG. 1 1



09924503-000001

FIG.1 2A

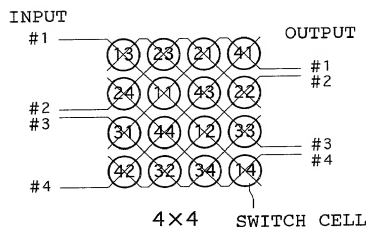


FIG.1 2B

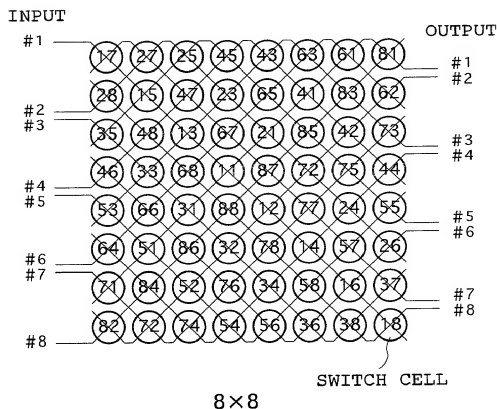


FIG.1 3A

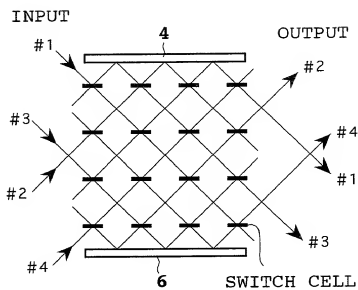


FIG.1 3B

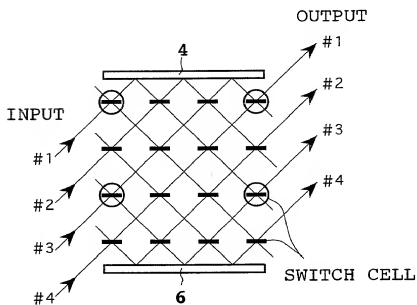


FIG.1 4A

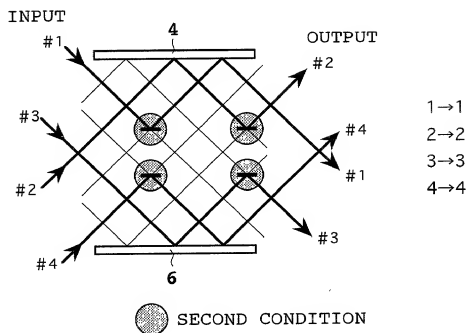


FIG.1 4B

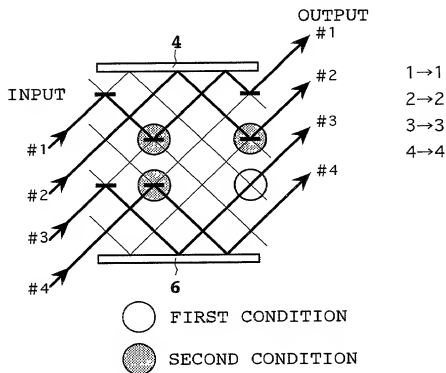


FIG. 15

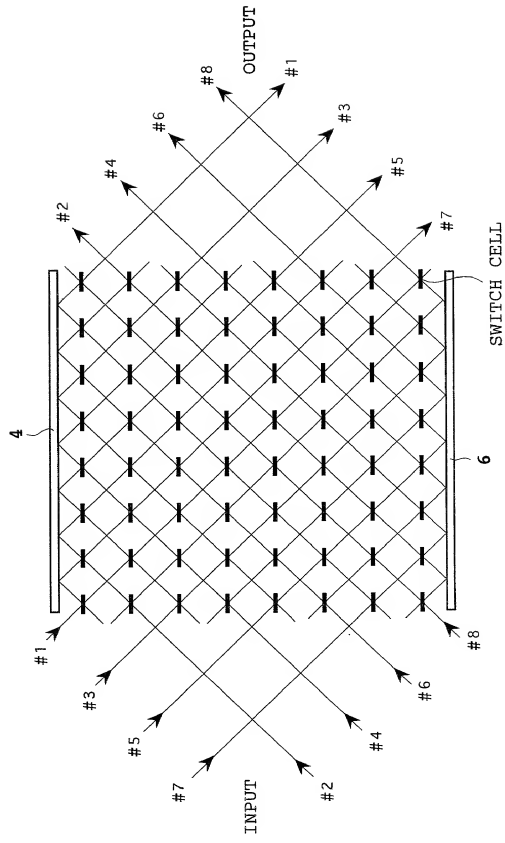


FIG. 16

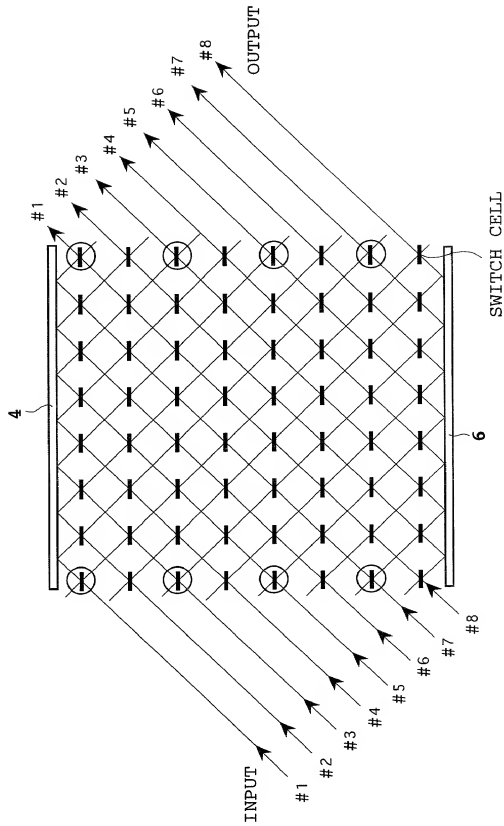


FIG.17A

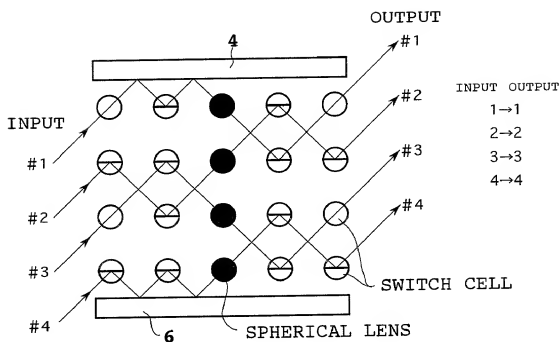


FIG.17B

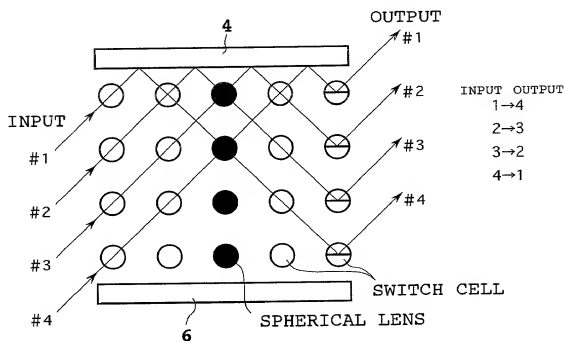


FIG. 18

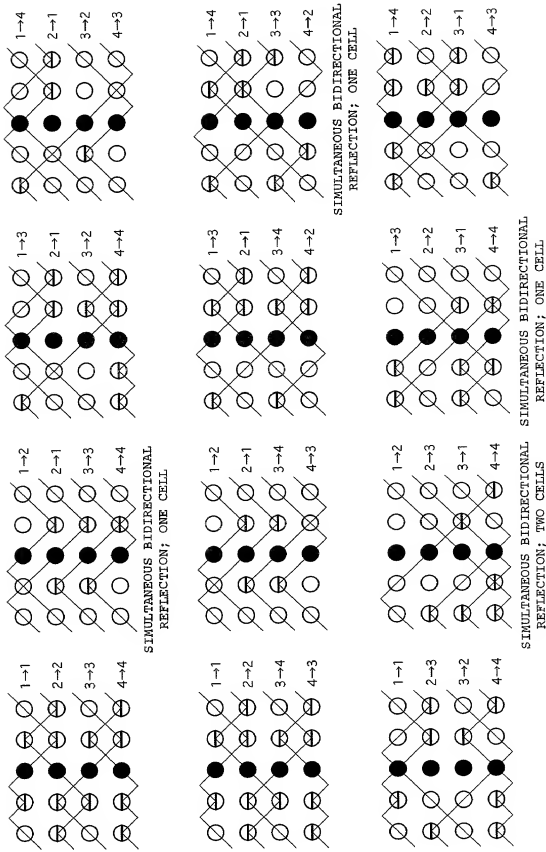


FIG. 19

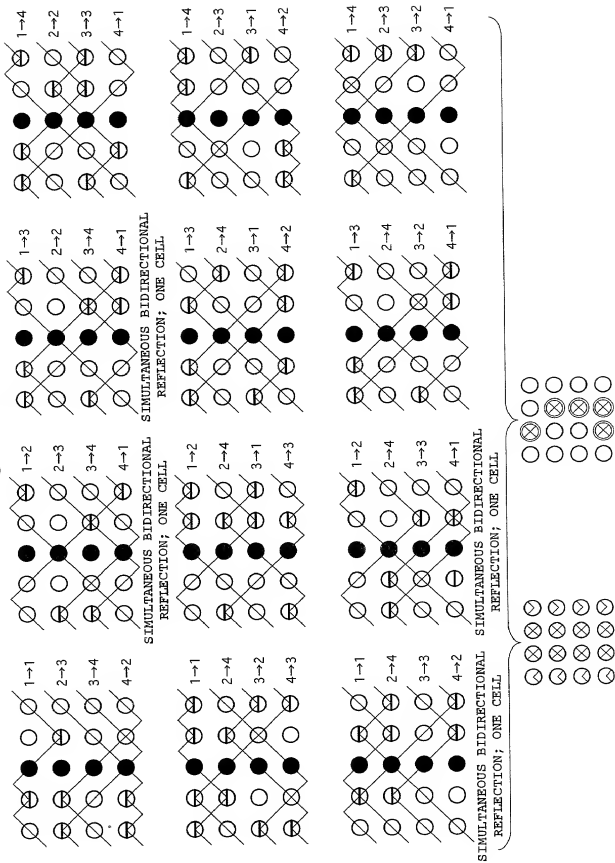
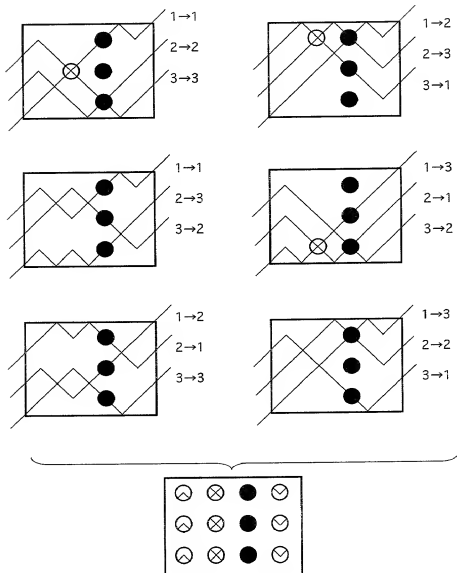
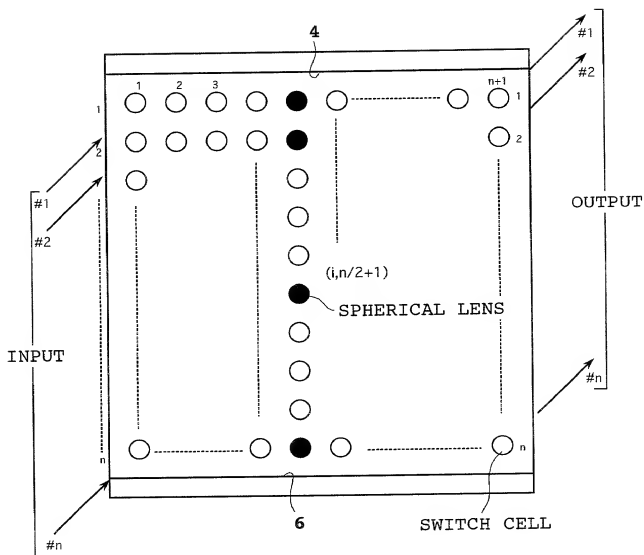


FIG.20



⊗ SIMULTANEOUS BIDIRECTIONAL
REFLECTION MIRROR

FIG.21



09924605-080901

FIG.22

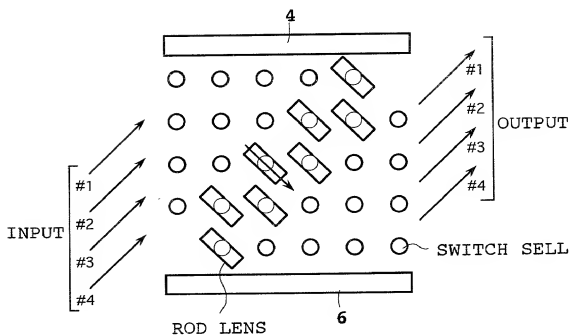


FIG. 23

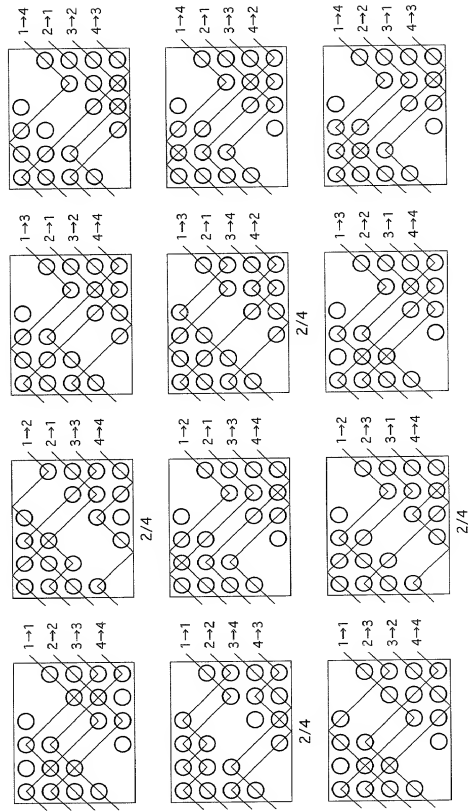


FIG. 24

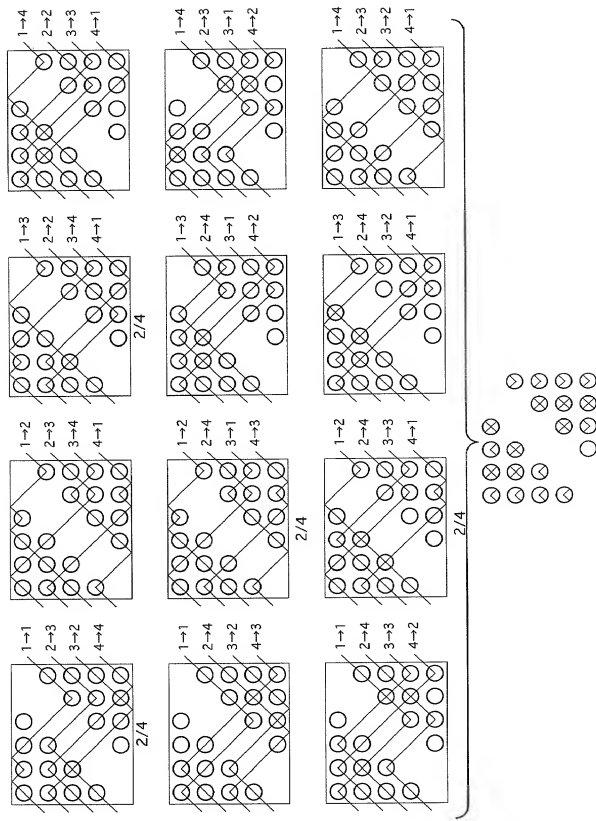
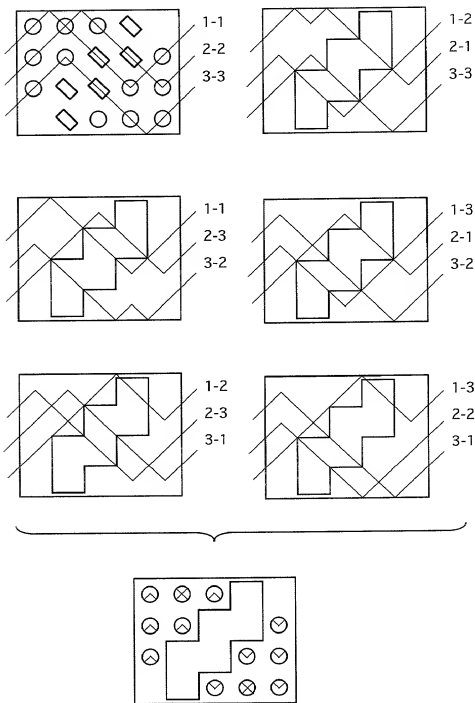


FIG.25



09924506 080901

FIG.26

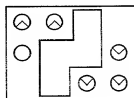
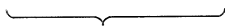
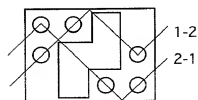
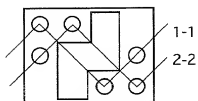


FIG.27

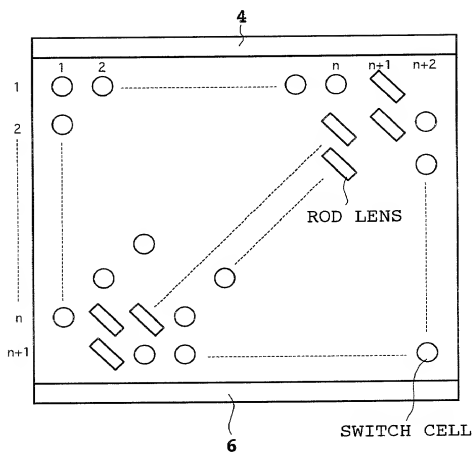


FIG.28

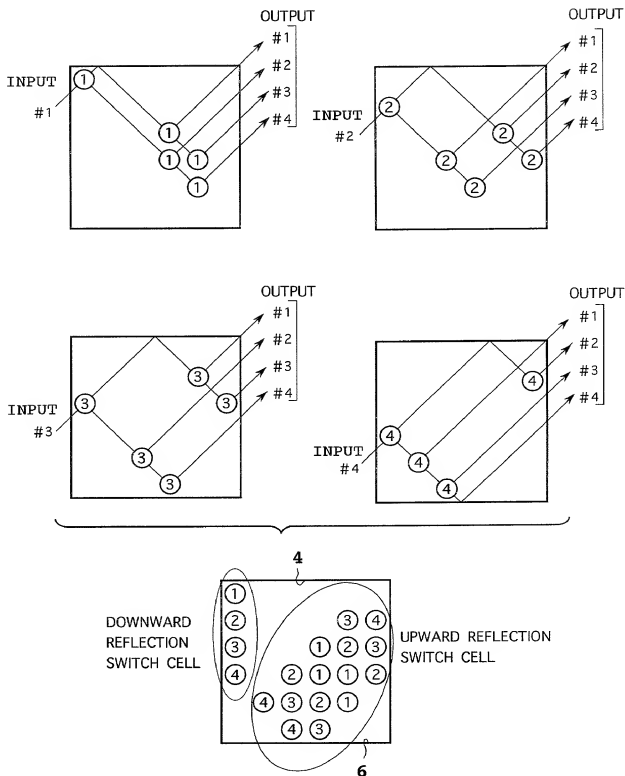


FIG.29

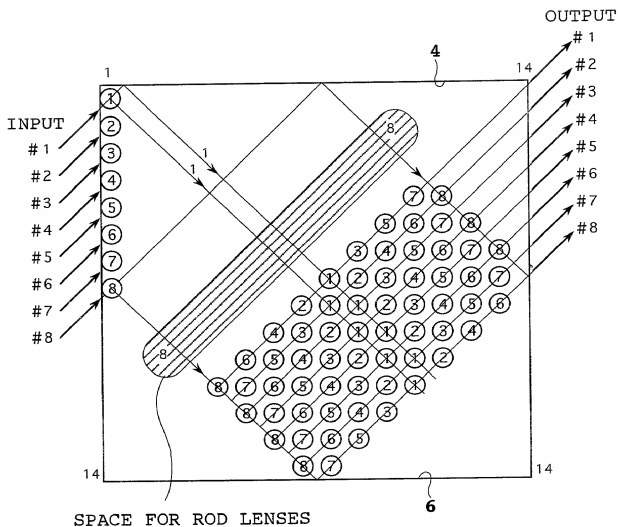


FIG.30

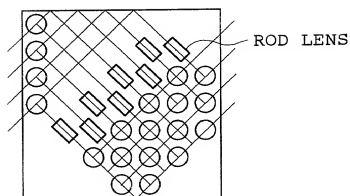
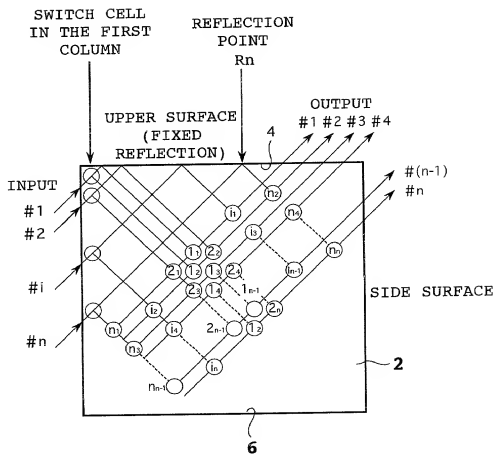


FIG.31



①_i : UPWARD REFLECTION SWITCH CELL FOR
CONNECTING INPUT CHANNEL #i
TO OUTPUT CHANNEL #n

FIG.32

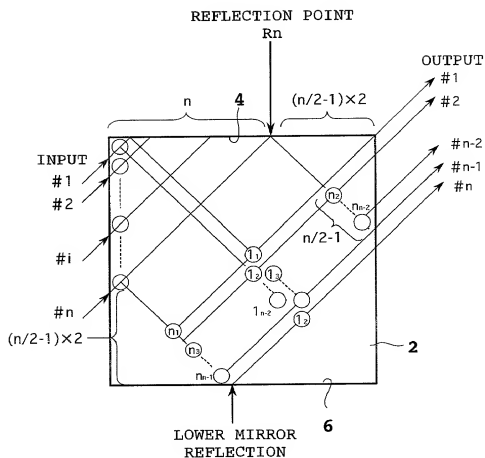


FIG.33

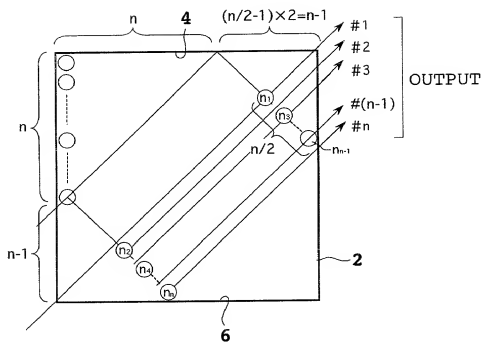


FIG.35

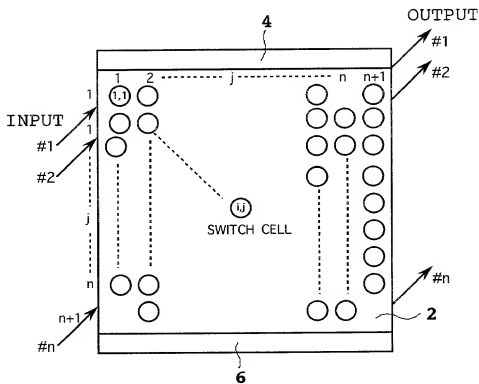


FIG.36

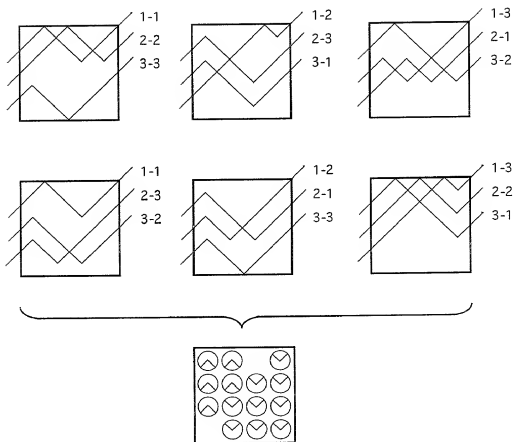
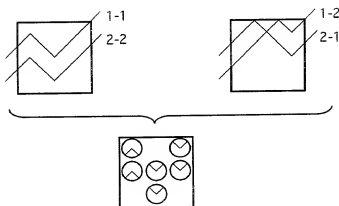


FIG.37



2 x 2 OPTICAL SWITCH:

SIZE; 3 x 3

OPTICAL PATH LENGTH; 3

NUMBER OF CELLS; 6

NUMBER OF UPWARD REFLECTION MIRRORS; 4

NUMBER OF DOWNWARD REFLECTION MIRRORS; 2

NUMBER OF REFLECTIONS ; ALWAYS 2

FIG.38

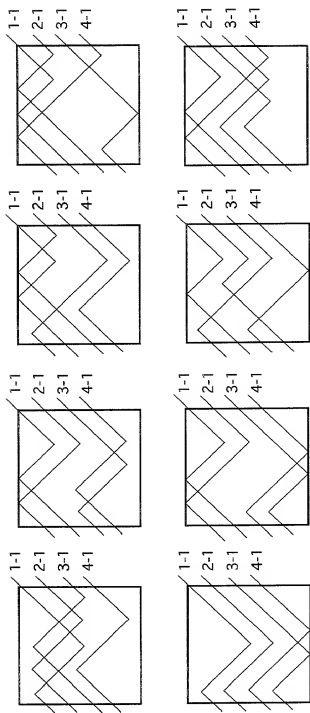


FIG.39

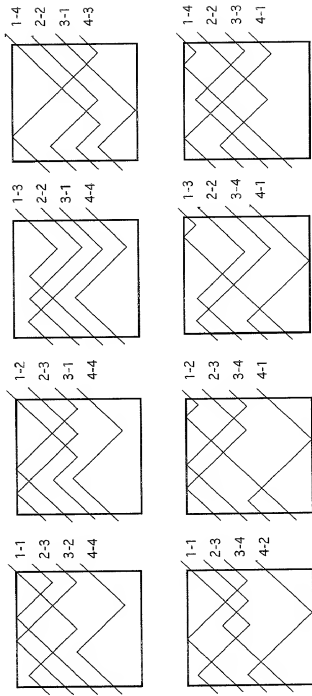


FIG. 40

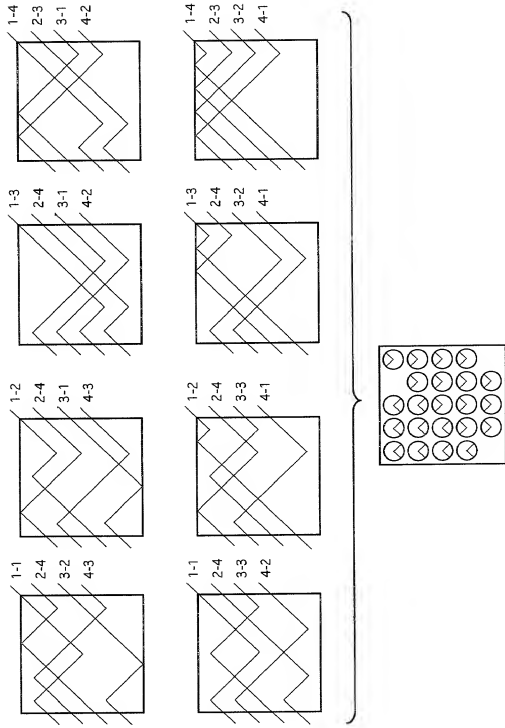


FIG.41

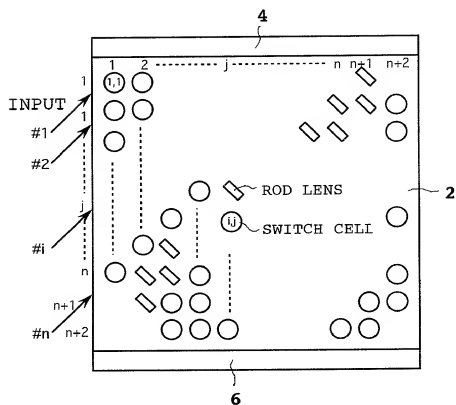


FIG. 42

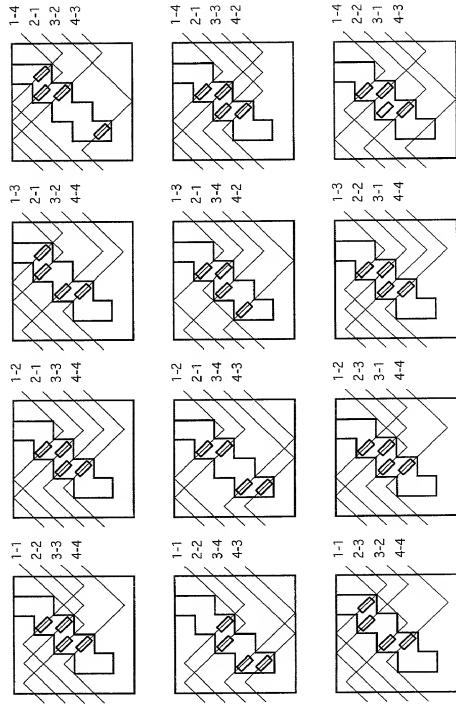


FIG. 43

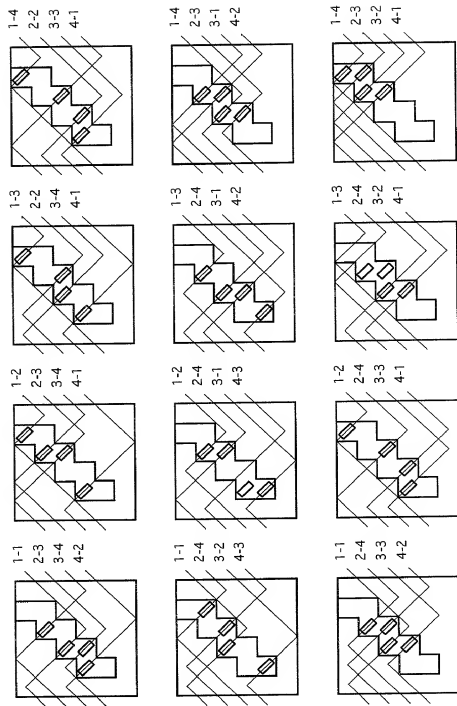


FIG.44

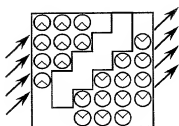
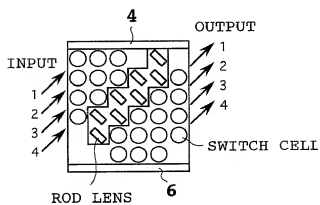


FIG.45

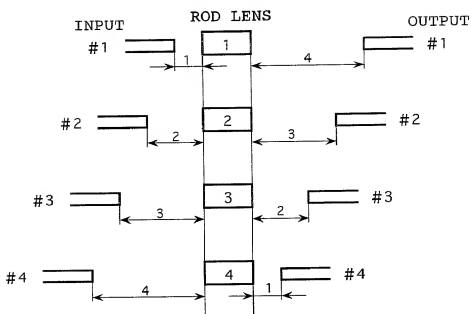
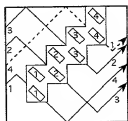


FIG.46

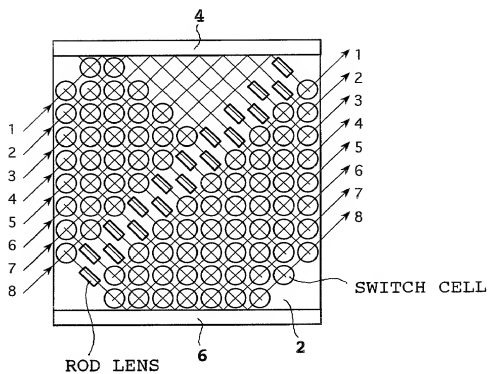


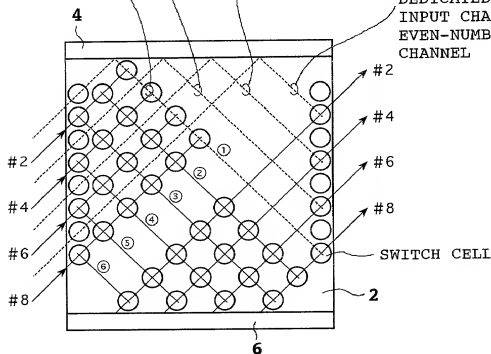
FIG.47

DEDICATED ROUTE FROM INPUT
CHANNEL #1 TO EVEN-NUMBERED OUTPUT CHANNEL

DEDICATED ROUTE FROM INPUT
CHANNEL #3 TO EVEN-NUMBERED OUTPUT CHANNEL

DEDICATED ROUTE FROM INPUT
CHANNEL #5 TO EVEN-NUMBERED OUTPUT CHANNEL

DEDICATED ROUTE FROM
INPUT CHANNEL #7 TO
EVEN-NUMBERED OUTPUT
CHANNEL



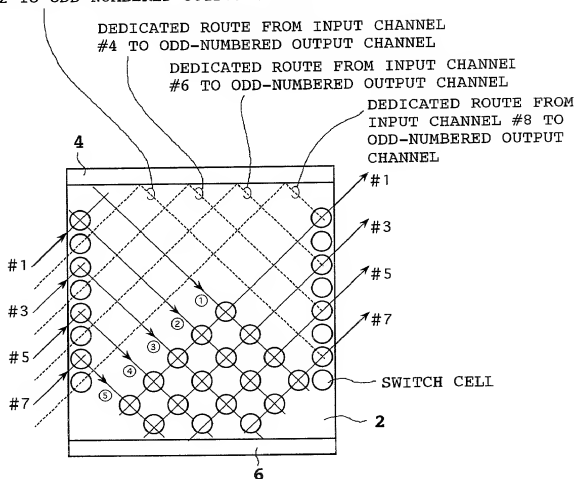
- ①, ②, ③ : ROUTES TO OUTPUT CHANNELS
#2, #4, #6, AND #8
- ④ : ROUTES TO OUTPUT CHANNELS
#2, #4, AND #6
- ⑤ : ROUTES TO OUTPUT CHANNELS
#2, AND #4
- ⑥ : ROUTES TO OUTPUT CHANNELS
#2

INPUT CHANNEL	ROUTE TO EVEN-NUMBERED OUTPUT CHANNEL
2	①/②/③
4	①/②/③, ④
6	①/②/③, ④, ⑤
8	①/②/③, ④, ⑤, ⑥

INPUT CHANNEL	OUTPUT CHANNEL	ROUTE
2 → 2	2	① or ② or ③
4 → 4	4	① or ② or ③
6 → 6	6	④
8 → 8	8	① or ② or ③

FIG.48

DEDICATED ROUTE FROM INPUT CHANNEL
#2 TO ODD-NUMBERED OUTPUT CHANNEL



①, ② : ROUTES TO OUTPUT CHANNELS
#1, #3, #5, AND #7

③ : ROUTES TO OUTPUT CHANNELS
#1, #3, #5 AND #7 WHEN
INPUT CHANNEL IS #3, #5, OR
#7

④ : ROUTES TO OUTPUT CHANNELS
#1, #3, AND #5

⑤ : ROUTES TO OUTPUT CHANNELS
#1 AND #3

INPUT CHANNEL	ROUTE TO ODD-NUMBERED OUTPUT CHANNEL
1	①/②
3	①/②, ③
5	①/②, ③, ④
7	①/②, ③, ④, ⑤

INPUT CHANNEL	OUTPUT CHANNEL	ROUTE
1 →	1	① or ②
3 →	3	③
5 →	5	④
7 →	7	① or ②

FIG.49

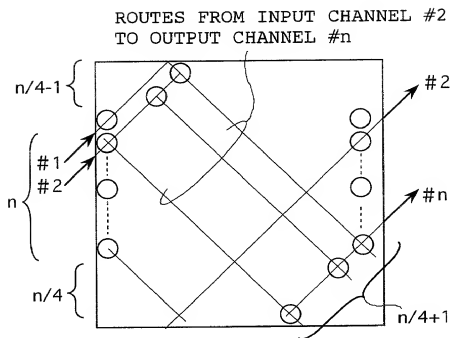
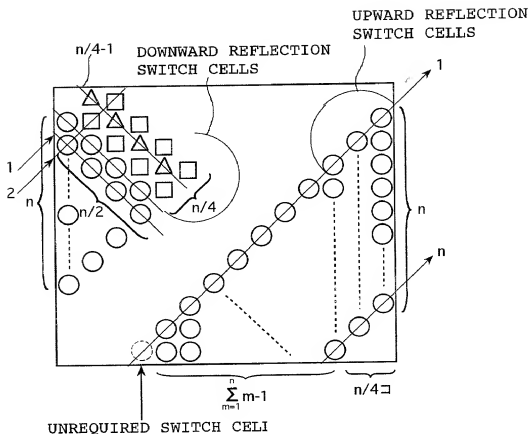


FIG.50



NUMBER OF UPWARD REFLECTION SWITCH CELLS : $\sum_{m=1}^n m-1 + \frac{n}{4} \times n = \frac{n(n+1)}{2} - 1 + \frac{n^2}{4} = \frac{3}{4} n^2 + \frac{1}{2} n - 1$

NUMBER OF DOWNWARD REFLECTION SWITCH CELLS : $2 \cdot \sum_{m=1}^{n/2} m + \frac{n}{4} \times \frac{n}{2} + \left(\frac{n}{4} - 1 \right) \times \frac{n}{2} = \frac{n^2}{2}$

○ SHOWN IN LEFT UPPER PORTION OF THE FIGURE

□ SHOWN IN THE FIGURE

△ SHOWN IN THE FIGURE

NUMBER OF ALL SWITCH CELLS : $\frac{5}{4} n^2 + \frac{1}{2} n - 1$

FIG. 51

